

# EUROPEAN PATENT OFFICE

## Patent Abstracts of Japan

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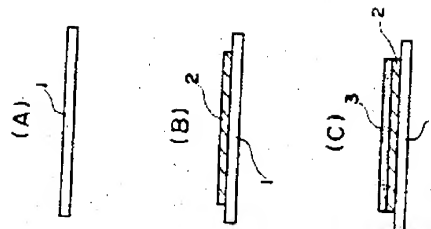
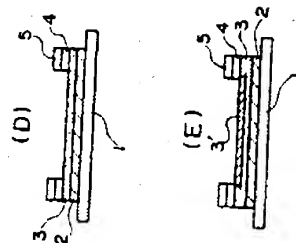
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TITLE : THIN FILM RESISTOR AND  
MANUFACTURE THEREOF



ABSTRACT : PURPOSE: To obtain a thin film resistor whose temperature coefficient is almost zero and which enables reducing the equipment cost and the product manufacturing cost, by laminating a tantalum nitride film of a negative temperature coefficient and an  $\alpha$ -tantalum film of a positive temperature coefficient on an alumina substrate, and by canceling both temperature coefficients each other out.

CONSTITUTION: A  $Ta_2N$  film 2 is formed on an alumina substrate 1, and an  $\alpha$ -Ta film 3 of bcc structure is formed on this  $Ta_2N$  film 2. After that, electrodes comprising compound films of NiCr alloys 4 and Au 5 are attached to the  $\alpha$ -Ta film 3. Then, they are heat-treated along with the electrodes in the atmosphere kept at 300°C, and a tantalum pentoxide film 3' is formed by oxidizing the surface of the part of the  $\alpha$ -Ta film 3 where the electrodes are not attached. At this time, a part of them is connected with lead wires as a monitor to a resistance value measuring device outside of the heat-treating device, and they are simultaneously heat-treated until the temperature coefficient of the monitor becomes zero. In this way, a plurality of thin film resistors whose temperature coefficients are zero are obtained at the same time.

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